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| APPLICATION NO.                                                                 | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.    | CONFIRMATION NO. |
|---------------------------------------------------------------------------------|-------------|----------------------|------------------------|------------------|
| 10/073,148                                                                      | 02/13/2002  | Jun Sunakawa         | Q68522                 | 5452             |
| 7590                                                                            | 10/07/2003  |                      | EXAMINER               |                  |
| SUGHRUE MION, PLLC<br>2100 Pennsylvania Avenue, NW<br>Washington, DC 20037-3213 |             |                      | WYSZOMIERSKI, GEORGE P |                  |
|                                                                                 |             |                      | ART UNIT               | PAPER NUMBER     |
|                                                                                 |             |                      |                        | 1742             |

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                        |                     |
|------------------------------|------------------------|---------------------|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|                              | 10/073,148             | NAGAO ET AL.        |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |
|                              | George P Wyszomierski  | 1742                |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 04 August 2003.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |                                                                                                       |                                                                              |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                      | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) Z . | 6) <input type="checkbox"/> Other: _____ .                                   |

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (U.S. Patent 6,401,799) in view of East German patent 266,046, and further in view of Lieberman (U.S. Patent 4,676,298).

Arai discloses producing amorphous magnetic ribbons by ejecting a melt of the desired material onto a rotating quench wheel. In order to maintain an appropriate surface roughness of the surface of the quench wheel, the peripheral surface of the quench wheel in Arai may be subjected to grinding; see Arai column 8, lines 8-33. In the examples of Arai, the cooling roll has a surface roughness of 0.5 microns; see Arai column 14, line 61. With regard to instant claims 3 and 4, the examiner notes that these claims define using materials which contain a certain percentage "or less" of various elements, and the examiner asserts that processes which utilize compositions containing 0% of those elements fully meet the claimed requirements. With regard to instant claims 6-9, Arai column 15, lines 1-10 discloses roll speeds and ribbon thickness as presently claimed. While Arai does not specify the presently claimed melt temperature range, the examiner submits that clearly the melt temperature in the prior art must be higher than the melting point of the alloy, and that one of ordinary skill in the art would select a temperature which is high enough to insure proper melting but which, for economic reasons, is not excessively higher than the melting point.

Arai does not specify the ten-point average surface roughness value as presently claimed, does not specify grinding the roll surface during the casting process, and does not

disclose the use of carbon dioxide gas as presently claimed. These differences are not seen as resulting in a patentable distinction between the prior art and the claimed invention because:

a) The claimed ten-point average surface roughness is a multiple of eight times the maximum average surface roughness of the cooling roll. It is therefore likely that a roll having the presently claimed average surface roughness (e.g. the roll used in the Arai process) would also possess the claimed ten-point average roughness value.

b) Lieberman column 7, line 33 indicates that it was known, at the time of the present invention, to grind the surface of a quench wheel with a brush in processes of making amorphous alloy ribbons. The structure as shown in, e.g. Lieberman figure 4 would clearly be operative while casting is occurring, i.e. the surface of the roll would be treated with the brush (42) of Lieberman as the roll is rotating and while metal is flowing from nozzle (4). Thus, the concept of grinding the roll during the casting process as presently claimed in amended claim 1 would have been considered well-known at the time of the invention.

c) East German patent indicates that it was known in the art, at the time of the present invention, to supply carbon dioxide gas to a melt pool being sprayed onto a rotating cooling roller surface. The '046 patent indicates that this reduces surface roughness, i.e. the same purpose for which the carbon dioxide is employed in the claimed invention. This disclosure of DD '046 would have motivated one of ordinary skill in the art, seeking to produce ribbons of low surface roughness, to include a carbon dioxide spray when performing the process of Arai et al.

Thus, the combination of Arai et al., DD '046, and Lieberman would have taught the claimed invention to one of ordinary skill in the art.

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. in view of East German patent 226,046 and Lieberman '298, as set forth in item no. 2

supra, or over this combination of references in view of Yoshizawa et al. (U.S. Patents 5,611,871 or 5,966,064).

The examiner submits that one of ordinary skill in the art would recognize that heating an amorphous alloy to above its crystallization temperature for a short time would result in the formation of small crystal grains in the alloy, and thus the presently claimed process would be an obvious variant of the process as disclosed by the combination of Arai et al. and DD '046.

In any event, the Yoshizawa patents indicate it to be conventional in the art to produce nano-crystalline structures in amorphous alloy ribbons which have been formed on a rotating quench wheel, by subjecting the ribbons to a heat treatment step. Thus, the disclosures of Yoshizawa et al., when combined with the processes as taught by the combination of Arai et al. and DD '046, would have taught the claimed process to one of ordinary skill in the art.

4. In a response filed August 4, 2003, Applicant alleges that the claimed invention solves new problems not contemplated by Arai or DD '046 and which Applicants discovered in the production of ribbons at least 3000 m in length, that Arai only grinds prior to casting as opposed to during the casting, and/or that the gas used in the Lieberman process is different from that used in the claimed process. Applicant's arguments have been carefully considered, but are not persuasive of patentability because:

- a) Nothing in the instant claims limits the claimed process to the production of ribbons of any particular length (e.g. >3000 m).
- b) The Lieberman process includes a step of grinding the roll during the casting, as now recited in amended claim 1.

c) The gas used in DD '046 is equivalent to that used in the claimed process, and the Lieberman patent was cited to show the conventionality of the grinding process as presently claimed and not that of any particular gas. This grinding process would be the same in Lieberman regardless of what gas (if any) were used in that reference.

**5. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (703) 308-2531. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (703) 308-1146. Effective October 1, 2003, all patent application related correspondence transmitted by facsimile must be directed to the central facsimile number, (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.



GEORGE WYSZOMIERSKI  
PRIMARY EXAMINER

GPW  
October 6, 2003